COMP 605 -- Assignment # 6

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In this assignment, we have converted colored image into gray scale image using CUDA. I have used MATLAB to store the matrix form of an image into a text file and then I read it using ImgConvert.cu file. The RGB image size is 750x750x3. I performed operations for different variations of 2D Grids and 2D Blocks. The results are reported below. Here we see that the execution time is worst when BLOCKSIZE is (1,1,1). Also, as the x index and y index of the block size becomes equal, execution time increases. Finally, the observed error between MATLAB generated Gray image and ImageConvert.cu generated Gray image is 0.1134.

# Threads/ Block	Grid Values			Block Values			Time (sec)
	X index	Y Index	Z Index	X index	Y Index	Z Index	
1024	250	1	1	1	1024	1	0.05673
1024	250	1	1	2	512	1	0.00134
1024	250	1	1	4	256	1	0.00147
1024	250	1	1	8	128	1	0.00145
1024	250	1	1	16	64	1	0.00121
1024	250	1	1	32	32	1	0.00142
512	500	1	1	2	512	1	0.05321
512	500	1	1	4	256	1	0.00160
512	500	1	1	8	128	1	0.00163
512	500	1	1	16	64	1	0.00162
512	500	1	1	32	32	1	0.00153
256	1000	1	1	2	512	1	0.05691
256	1000	1	1	4	256	1	0.00162
256	1000	1	1	8	128	1	0.00159
256	1000	1	1	16	64	1	0.00162
256	1000	1	1	32	32	1	0.00161
128	2000	1	1	1	128	1	0.05721
128	2000	1	1	2	64	1	0.00162
128	2000	1	1	4	32	1	0.00161
128	2000	1	1	8	16	1	0.00153
64	4000	1	1	1	128	1	0.05721
64	4000	1	1	2	64	1	0.00162
64	4000	1	1	4	32	1	0.00162
64	4000	1	1	8	16	1	0.00153

32	8000	1	1	4	32	1	0.00152
32	8000	1	1	8	16	1	0.00143
32	8000	1	1	16	8	1	0.00153
16	16000	1	1	1	16	1	0.05351
16	16000	1	1	2	8	1	0.00172
16	16000	1	1	4	4	1	0.00173
8	32000	1	1	1	8	1	0.05732
8	32000	1	1	2	4	1	0.00193
4	64000	1	1	1	4	1	0.05743
4	64000	1	1	2	3	1	0.00223
2	128000	1	1	1	2	1	0.05778